Argonne Develops New Wind Power Forecasting Techniques

Unlike coal or nuclear power plants, wind farms produce energy in fits and spurts. When the wind is not blowing and a wind farm fails to produce much power, other power plants must increase their generation to pick up the slack.

The Challenge

Wind power forecasting is an important tool for managing the inherent variability and uncertainty in wind power generation. Increasing the accuracy of forecasting can help to reduce the likelihood of an unexpected gap between scheduled and actual wind power generation, which can be extremely helpful for operators of power systems and wind power plants.

Wind power has the potential to further diversify our domestic energy portfolio, but continued research is needed to improve reliability and to support deployment and long-term maintenance.

The Solution

To improve wind power forecasting and its use in power system operations, Argonne has assembled a team of experts in wind power forecasting, electricity market modeling, wind farm development and power system operations. The team is developing new wind power forecasting techniques to facilitate more accurate predictions of the amount of electricity that the wind power plants will generate at any given time. They are also looking at how to make the best use of the improved forecasts in operational decisions.

The Future

Although wind farms currently supply only a small percentage of America's electricity, improving our forecasting capabilities and operational models is an important part of maintaining the reliability and stability of the entire electrical system. With a more accurate wind power forecast, power system operators can better anticipate how much energy they will need from other plants on the same grid.

Improvements in wind power forecasting and better use of the forecasts in operational decisions will also help facilitate a large-scale penetration of wind power into the electric power system.

"The point of this project is to reduce uncertainty. At the same time, we are developing improved mathematical models for how to make decisions under uncertainty," **said Audun Botterud, energy systems engineer, Argonne National Laboratory. "*The more accurately we can predict how much wind there will be, the more efficiently and cheaply we can generate and transmit the power needed to meet our demand.*"**

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